

METHOD FOR FORMING MICROELECTRONIC SPRING STRUCTURES ON A SUBSTRATE

ABSTRACT OF THE DISCLOSURE

A method for fabricating microelectronic spring structures is disclosed. In an initial step of the method, a layer of sacrificial material is formed over a substrate. Then, a contoured surface is developed in the sacrificial material, such as by molding the sacrificial material using a mold or stamp. The contoured surface provides a mold for at least one spring form, and preferably for an array of spring forms. If necessary, the sacrificial layer is then cured or hardened. A layer of spring material is deposited over the contoured surface of the sacrificial material, in a pattern to define at least one spring form, and preferably an array of spring forms. The sacrificial material is then at least partially removed from beneath the spring form to reveal at least one freestanding spring structure. A separate conducting tip is optionally attached to each resulting spring structure, and each structure is optionally plated or covered with an additional layer or layers of material, as desired. An alternative method for making a resilient contact structure using the properties of a fluid meniscus is additionally disclosed. In an initial step of the alternative method, a layer of material is provided over a substrate. Then, a recess is developed in the material, and fluid is provided in the recess to form a meniscus. The fluid is cured or hardened to stabilize the contoured shape of the meniscus. The stabilized meniscus is then used to define a spring form in the same manner as the molded surface in the sacrificial material.